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THE CONSEQUENCES FOR METAPHYSICS OF QUANTUM-MECHANICS

METAPHYSICS has been related to physics historically almost in the way suggested by the etymology of the word, that is, as a discipline which follows after physics. The first instance in the history of Western philosophy of the building of a metaphysics on the basis of a physical theory was the construction of Parmenidean monism as a logical consequence of the Ionian postulate of a single fundamental world-stuff.[1] As another instance we might mention the generalization by Socrates of the Pythagorean physics of number into the Socratic theory of Ideas.[2] It is obvious too that the Cartesian metaphysics is based firmly on the prior determination of extension as the defining characteristic of matter, and Spinoza's dependence on Cartesian physics is equally obvious. Newtonian mechanics, as applied to atomic particles, has likewise been the god-father of nineteenth-century (and twentieth-century) materialism, and in our own generation we have the systems of Alexander, Whitehead, and Mead to bear testimony to the influence of relativity theory on metaphysical speculation.

We have witnessed in the last few years the development of a physical theory of quantum phenomena which promises to be just as significant historically as any of the physical theories mentioned above. The question now arises, What, if any, are the metaphysical implications of this new discipline of quantum-mechanics? What difference should it make in our metaphysical speculation? There have been numerous attempts to deduce the consequences for metaphysics of the present system of quantum-mechanics, and it is widely believed, for instance, that quantum physics has destroyed the possibility of belief in an objective determinism in nature. It is the thesis of this paper that quantum-mechanics in its present form and with its present interpretation has *no unambiguous metaphysical implications* and that as long as it retains its present form and interpretation no metaphysics can arise which will be related to it as the metaphysical systems previously mentioned were related to their antecedent physical theories.

[1] Cf. John Burnet, *Early Greek Philosophy*, second edition, 1908, p. 206.

[2] Cf. John Burnet, *Greek Philosophy, Thales to Plato*, 1914, Ch. IX.

This would seem to be a matter of considerable importance for metaphysics, since if modern atomic physics is metaphysically "neutral," it will not be able to provide a starting point for future speculation nor will it be able to corroborate or disprove any existing systems. This fact that quantum physics can no longer disprove the utterances of the metaphysician might be considered a boon for metaphysics, in the sense that it has been given a "free hand" to say what it likes. The advantage is specious, however, if one persists in regarding metaphysics as the science which deduces the "real" nature of things from *a priori* considerations, for if physical science has given up any attempt to describe the "real" nature of the physical world, it is hardly to be expected that any credence will be given to the speculations of an arm-chair philosophy. The point here is that any rationalistic metaphysics, without the support of a rationalistic physics, is almost certainly doomed. The conclusion is: If quantum-mechanics continues to be successful in its account of quantum phenomena and if, as we have maintained, it is metaphysically neutral, then metaphysical speculation, if it is to maintain itself, must considerably alter its method and its pretensions. If it can no longer use the results of a rationalistic physics, it must discover some province, some range of phenomena, to which it can *legitimately* confine itself—or die slowly of inanition. I do not propose to suggest in this paper what that range of phenomena should be. What is of immediate importance is the demonstration that the recent developments of quantum physics are significant for metaphysics precisely because they have *no* "metaphysical implications."

The metaphysical neutrality of quantum-mechanics is due principally to two causes. One of these is unquestionably the arbitrary acceptance by its founders of a positivistic theory of knowledge. The outlines of this epistemology are clearly stated in these passages from Heisenberg's original paper:

> It is well known that this weighty objection can be brought against the formal rules which are commonly used in the quantum theory for the calculation of observable quantities (e.g., the energy in the hydrogen atom): that those rules of calculation contain as essential components relations between quantities which apparently in principle [*principiell*] cannot be observed (as e.g., position, period of revolution of the electron), that consequently those rules lack every empirical [*anschauliche*] physical foundation, unless one clings to the hope that later perhaps these quantities which until now have been unobservable can be made experimentally accessible. . . . In such a situation it seems wiser to give up completely this hope of an observation of hitherto unobservable quantities (such as position and period of revolution of an electron), to admit at the same time, therefore, that the partial agreement of these quantum rules with experiment is more or less accidental, and to try

to construct a quantum-mechanics analogous to classical mechanics in which only relations between observable quantities appear.[3]

Heisenberg, however, is not alone responsible for the anti-rationalism of quantum-mechanics, and in this connection Jordan has called attention to the fact that "the matrix theory of quantum-mechanics is nothing else than the extension and fulfillment of the tendencies expressed in Bohr's correspondence principle."[4] It is more accurate, therefore, to regard Bohr as the founder of that *Kopenhagener Geist der Quantentheorie,* to use Heisenberg's expression,[5] which has been almost solely responsible for the development of matrix-mechanics, and this mechanics itself may be regarded as the "further development of quantum-kinetics" which Bohr had envisaged in 1923[6] as the extension of his correspondence principle. It is necessary, therefore, to examine Bohr's epistemology in its relationship to this principle.

The correspondence principle in its earliest form (1913)[7] had been merely the suggestion of a correspondence of the frequencies of radiation emitted by an atom, computed on the basis of Einstein's extension of Planck's quantum-postulate, with the frequencies of revolution of the electrons in the atom according to classical mechanics. Bohr assumed the correctness of this correspondence in the case of radiation of long wave length on the basis of the success of Lorentz's computations, according to classical theory, of the absorptive power of a metal when subjected to radiation of low frequency. This correspondence in the case of low frequencies (corresponding to large quantum numbers) suggested a wider correspondence between the higher frequencies of the radiation as computed by the quantum theory and the harmonic components of the frequency of revolution as computed by classical theory. This wider correspondence became more than a mere approximation to classical mechanics in the decade between 1913 and 1923, and by 1923 Bohr could speak of the correspondence principle as a "typical law of quantum theory which is directly connected with the postulates of the quantum theory and in itself is not at all connected with the questions of the degree of approximation of the application of the classical radiation laws."[8] The formulation of

[3] W. Heisenberg, *Zeitschrift für Physik,* Vol. 33 (1925), p. 879. I have consistently translated all quotations incorporated into the text of this paper.

[4] P. Jordan, *Anschauliche Quantentheorie,* 1936, p. iii.

[5] W. Heisenberg, *The Physical Principles of the Quantum Theory,* tr. by C. Eckart and F. C. Hoyt, 1930, p. x.

[6] N. Bohr, *Zeit. für Physik,* Vol. 13 (1923), p. 117.

[7] Cf. N. Bohr, *The Theory of Spectra and Atomic Constitution,* 1922, Essay I.

[8] *Zeit. für Physik,* Vol. 13 (1923), p. 130.

the laws of "quantum-mechanical quantities" by Heisenberg without the use of classical models is the next step in this development.

There is one assumption which seems to have guided Bohr not merely in the statement and development of the correspondence principle but also in the statement of the fundamental postulates of his "quantum theory of line spectra." This is the assumption that Planck's discovery of the necessity of assuming discrete energy levels in a harmonic oscillator had introduced an essential "irrationality" into the structure of classical physics,[9] if by irrationality we mean the impossibility of a complete and detailed *visualization* of all the physical processes ultimately responsible for our experimental results. Planck himself had acknowledged the formal inadequacy of his procedure in using the quantum postulate in conjunction with principles of classical electrodynamics that were inconsistent with it, and he could defend himself only by saying that he had "always stood for making as close a connection between the hypothesis of quanta and the classical dynamics as possible, and for not stepping outside the boundaries of the latter until the experimental facts leave no other course open."[10] Bohr solved this problem of the reconciliation of classical electrodynamics and the quantum postulate, not by an attempt to minimize their contrariety, but by a prescription of spheres of influence: the laws of classical mechanics were to govern the motions of the electrons in their orbits, the motions *within* the "stationary states" of the system, and the quantum postulate was to govern the transitions *between* stationary states. This is an explicit incorporation of "irrationality" within the structure of the theory, and it rested on the assumption that an atomic model could be successful which was incapable of being "understood," that is, visualized. This method is what Heisenberg has called "the incorporation of a contradiction among the working hypotheses" of a theory,[11] and in Bohr's case it seems to have sprung from a conviction that any detailed knowledge of atomic processes was impossible.[12]

[9] Cf. *The Theory of Spectra and Atomic Constitution*, p. 6, and *Atomic Theory and the Description of Nature*, 1934, p. 7.

[10] M. Planck, *The Theory of Heat Radiation*, tr. by M. Masius, 1914, p. viii.

[11] W. Heisenberg, *Mitteilungen des Universitaetsbundes Goettingen*, Jahrgang 16 (1934), Heft 1, p. 11.

[12] W. Heisenberg, *Naturwissenschaften*, Vol. 23 (1935), p. 679, "Mehr als andere Naturforscher ist—so scheint es seinen Schülern—Bohr sich dessen bewusst, dass jeder Versuch einer Naturerkenntnis gleichsam über einer grundlosen Tiefe schweben muss, dass es zwischen dem Bewusstsein und dem Glauben an eine reale objektive Aussenwelt nirgends eine für immer festge-

It seems possible then to assume that Bohr's original procedure in incorporating inconsistent postulates in his quantum theory of spectra was based on a conviction of the futility of the classical attempts to obtain a rational knowledge of objective atomic processes in terms of self-consistent models. It is this denial of rationalistic epistemology which supports likewise his attempts by means of the correspondence principle to establish a body of laws for quantum theory which will be simply an analogy of the older classical laws and which use the classical laws merely for the purpose of suggesting new "formal" relationships.[13] This recognition of the "formalism" of physical laws leads immediately to a descriptive theory of science, and we find Bohr's original anti-rationalism developing naturally to the verge of the positivism finally announced by Heisenberg in dispensing with classical models altogether.

The bearing of this result on the question of the metaphysical neutrality of quantum-mechanics is this: that no conclusions concerning the "real" character of the physical world can be drawn from a theory grounded on the assumption that knowledge of the "real" character is impossible. That the matrix-mechanics of Heisenberg-Born-Jordan is actually a "descriptive" mechanics can not be shown in this paper, and I can only refer the reader to the numerous systematic presentations.[14] I have attempted to show merely that the contemporary interpretation of matrix-mechanics by Bohr and Heisenberg is simply a natural outgrowth of the assumptions which guided historically the development of the correspondence principle and Heisenberg's mechanics and that any alternative interpretation must be prepared therefore to repudiate the Bohr theory of the atom *in toto.*

This arbitrary acceptance by Bohr and Heisenberg of a positivistic theory of knowledge is not the only cause, however, for the metaphysical neutrality of quantum-mechanics. The difficulty of a rationalistic interpretation of quantum phenomena has had to be recognized by even the most rationalistic of modern physicists by

legte Strasse des Erkennens gibt, die auf sicherem Grund vom bekannten Gebiet in unbekanntes Neuland führt."

N. Bohr, *Atomic Theory and the Description of Nature,* p. 18: "We meet here in a new light the old truth that in our description of nature the purpose is not to disclose the real essence of the phenomena but only to track down, so far as it is possible, relations between the manifold aspects of our experience."

[13] Cf. Note 6.

[14] E.g., Jordan, *Anschauliche Quantentheorie,* or H. A. Kramers, *Die Grundlagen der Quantentheorie,* Vol. I of *Theorien des Aufbaues der Materie, Hand- und Jahrbuch der Chemischen Physik,* Band 1, Abschnitt 1, 1933.

reason of the difficulty of "physical interpretation" of the mathematical equations which have been employed in the discussion of the new experimental data. In this sense a positivistic attitude seems not merely to have been arbitrarily accepted as one possible alternative but to have been forced on the physicist in the natural course of development of physical theory and experiment. That this is the sole reason for the positivism of contemporary physics is, of course, the contention of Heisenberg [15] and Bohr.[16]

We may, of course, regard the successes of Bohr's theory in the years from 1913 to 1925 as an indication of the necessity of renouncing a fully rational account of atomic processes, but that some hope remained of removing the irrationalities of Bohr's account and replacing his model by a new model capable of some sort of visualization, is obvious by the efforts of de Broglie and Schrödinger to found a wave-mechanics in which the quantum-postulate no longer appears as an irrationality but can be simply derived from certain natural properties of the atom.[17] In spite of the success of this point of view the difficulty remained that certain fundamental elements of the mathematical formulation had no rational interpretation in the classical sense. This was true of the "wave-functions," which were intended to represent the amplitude of the "phase waves" associated with the motion of the individual particles. Actually the motion of a particle was associated with the motion of a "wave-packet," but by reason of the ambiguity in the meaning of the wave-functions themselves, no clear account could be given of the relationship of the particles to the attendant waves.

There are two common objections to the assumption that the wave-functions have a physical meaning.[18] The first is that the wave-functions, as they appear in the mathematical theory, are imaginary quantities and therefore can not represent any "real" physical characters in nature. This is plainly a specious argument once it is recognized that all mathematical concepts are essentially abstract, and that the distinction of "real" and "imaginary" is a relic of the time when the logical foundations of mathematics had not been investigated. If all physical quantities were vectorial, "imaginary" quantities would be more fitted to represent

[15] *Wandlungen in den Grundlagen der Naturwissenschaft*, 1936, p. 7.

[16] *Atomic Theory and the Description of Nature*, Chapter I, "Atomic Theory and Mechanics."

[17] Cf. E. Schrödinger, *Collected Papers on Wave Mechanics*, tr. by J. F. Schearer and W. M. Deans, 1928, p. 1.

[18] Cf. Jordan, *op. cit.*, p. 160; also Bohr, *Atomic Theory and the Description of Nature*, p. 76.

them than "real" numbers. The second objection is that the wave-functions are supposedly the amplitudes of waves in "configuration-space" which, with the exception of the case of single particles, is assumed to have more than three dimensions. This objection is a serious one for those who demand understanding by visualization, since it is clear that in this case the amplitudes would have no visualizable character, and the attempt, therefore, to construct a visualizable quantum theory on the analogy of the classical model must break down.

Schrödinger, however, constructed a useful interpretation of the wave-function by assuming that the product of the wave-function and its complex conjugate was a measure of "electric charge density" in the case of single electrons.[19] There was difficulty, however, in the extension of this interpretation to the case of a system of particles. By reason of this difficulty an alternative interpretation is generally accepted[20] which considers the product of the wave-function and its complex conjugate as merely a probability function which has no reference to visualizable elements and merely gives a probability for the appearance of certain numerical results if a measurement be performed. This is the interpretation of the exponents of a descriptive mechanics and is given, for instance, by Jordan[21] and Kramers.[22] In regard, therefore, to the crucial point of the wave-functions appearing in the Schrödinger wave equations, the actual historical advance has been in the direction of a symbolic or formal interpretation of their physical significance and away from any interpretation which would assign to them a "visualizable" physical character.

This re-interpretation has been achieved by the remarkable discovery, made by Schrödinger himself[23] (and independently by C. Eckart), that the systems of wave-mechanics and matrix-mechanics were mathematically equivalent, that is, for any expression in one system an equivalent expression could be found in the other. On the basis of this equivalence the exponents of the formalistic mechanics could re-interpret all the results of wave-mechanics in conformity with the positivistic assumptions at the basis of their own point of view, and in particular the concepts of "matter waves," "wave packets," and "electric charge density" (as defined by Schrödinger) lost all physical significance. The problem of the

[19] Cf. A. E. Ruark and H. C. Urey, *Atoms, Molecules, and Quanta*, 1930, Chapter XV, Section 1.

[20] *Ibid.*, p. 519.

[21] *Op. cit.*, p. 157.

[22] *Op. cit.*, p. 49.

[23] Cf. *Collected Papers on Wave Mechanics*, p. 45.

physical significance of the wave-functions could now be solved by interpreting them in terms of the equivalent expressions in matrix-mechanics. Schrödinger [24] pointed out that the equivalence acted conversely and that matrix-mechanics could likewise be translated into wave-mechanics, but this translation did not enable him to solve his fundamental problem—the interpretation of the successful mathematical expressions of wave-mechanics.

This discovery of the mathematical equivalence of the two rival theories was made in 1926, and shortly after that (1927) Bohr [25] suggested his well-known doctrine of "complementarity," building on Heisenberg's indeterminacy principle, and developing his earlier beliefs of the impossibility of an exact spatio-temporal description of atomic phenomena into a systematic critique of the use of the concepts of "waves" and "particles" in modern physics. Heisenberg's indeterminacy principle asserts the impossibility of measuring simultaneously with an unlimited degree of precision both the momentum and position of a particle and likewise the impossibility of measuring precisely its energy at a given instant of time. Bohr could derive from this result the conclusion that a description of atomic phenomena in terms of momentum and energy could be obtained only by a renunciation of a description in terms of spatial and temporal location. This conclusion could be transferred from the domain of measurement to the domain of theory, and Bohr could show that only Schrödinger's wave-theory could account properly for the energy-levels within the atom (and for all determination of energy and momentum according to Einstein's quantum formula), but only a particle picture would satisfy the demands for a detailed spatio-temporal description. The inference is that both a wave picture and a particle picture are necessary in modern physics for the "explanation" of physical phenomena, but both can not be used simultaneously. This means too that both are abstractions, and neither can lay claim to being the "true" picture. In this fashion the old problem of the dual character of light and the new problem of the dual nature of matter receive a final solution.

This solution is of considerable importance since it enables the physicist to use mathematical equations, based directly or indirectly on the wave-picture, without committing himself to a belief in the existence of waves, and likewise he can use a matrix-mechanics which is applicable to the discussion of the "motion" and "coordinates" of particles without committing himself to an actual belief in particles. By reason of this fact a possible criticism of

[24] *Ibid.*, p. 58.

[25] Cf. *Atomic Theory and the Description of Nature*, p. 52.

quantum-physicists that they assume the existence of waves or particles in the equations or discussion while explicitly denying their existence is quite groundless.

The thesis of this paper is a hypothetical proposition: If the contemporary formulation of quantum-mechanics proves to be persistently successful, there can be no metaphysical implications of quantum physics. The demonstration of the metaphysical neutrality of quantum-mechanics I have attempted to carry out by a reference to the positivistic assumptions at the basis of the developments of Bohr and Heisenberg and the failure of all attempts to interpret the equations of quantum-mechanics from a classical or "metaphysical" point of view. The problem of the correctness of the prevailing interpretation of quantum-mechanics has received no explicit attention in this paper. I have been content merely to attempt the demonstration of an "if . . . then" proposition.

The current discussions, however, concerning the actual (and therefore probable) success of quantum-mechanics have considerable interest for a philosopher since the disagreements seem, for the most part at least, to arise from a divergence of epistemologies. I am referring in particular to the recent controversy initiated by Einstein, Podolsky, and Rosen in an article entitled, "Can Quantum-Mechanical Description of Physical Reality Be Considered Complete?" [26] According to Einstein and his collaborators a theory is successful if it is (1) correct and (2) complete. Its correctness is judged "by the degree of agreement between the conclusions of the theory and human experience." A necessary condition for its completeness is that "every element of the physical reality must have a counterpart in the physical theory." A "criterion" for physical reality is given as follows: "If, without in any way disturbing a system, we can predict with certainty (i.e., with probability equal to unity) the value of a physical quantity, then there exists an element of physical reality corresponding to the physical quantity." On the basis of these assumptions Einstein attempts to demonstrate the incompleteness of current quantum-mechanics.

The substance of the argument is this: Einstein shows that the assumption that quantum-mechanics is complete (according to the definition given) leads to the conclusion that two canonically conjugate quantities (such as position and momentum) defining the dynamical state of an atomic system can have simultaneous "reality," but this in turn is in direct contradiction to Heisenberg's

[26] A. Einstein, B. Podolsky, N. Rosen, *Phys. Rev.*, Vol. 47 (1935), p. 777. I have in several instances referred to the authors of this paper as "Einstein."

indeterminacy principle (which is an integral part of the "transformation theory" of quantum-mechanics).

Bohr [27] pointed out in reply that the criterion of reality adopted by Einstein could never be applied in practice by reason of the inevitable disturbance introduced by observations. By reason of this disturbance it is impossible to distinguish accurately between the measuring instruments and the measured object, and this will make any clear-cut definition of physical reality in Einstein's sense impossible. The criticisms of Ruark [28] and Furry [29] are likewise directed principally against the criterion of physical reality, but the following remark of Furry's has considerable importance because of its bearing on Einstein's condition for completeness, which is not explicitly treated in Bohr's discussion: ". . . we may certainly suppose that not all mathematical operators, even though subject to the proper formal requirements, correspond to experimentally measurable quantities." [30] This is not a contradiction of Einstein's condition of completeness, but it suggests a possible criticism: If there need be no correspondence between all the mathematical symbols appearing in our equations and experimentally measurable quantities, why need we assert that some symbols at least must correspond to "elements of the physical reality"? If "elements of physical reality" are to be defined in terms of experimentally measurable quantities, the answer is obvious, but in this case Einstein's criterion of reality becomes an analytical proposition. If Einstein's "reality" is to mean anything else than "experimentally measurable quantity," it is not obvious that elements of it must correspond with the mathematical quantities in the equations of quantum-mechanics, and this denial of an exact correspondence, hinted at in Furry's paper, is explicitly stated by Kemble in a recent paper.[31]

This denial that there must be an exact correspondence between the terms in a successful equation and "elements of physical reality" is simply the re-affirmation of the possibility of a "formal" theory, tested merely by the criterion of its *correctness,* in Ein-

[27] *Phys. Rev.*, Vol. 48 (1935), p. 696.

[28] A. E. Ruark, *Phys. Rev.*, Vol. 48 (1935), p. 466.

[29] W. H. Furry, *Phys. Rev.*, Vol. 49 (1936), pp. 393, 476. Schrödinger's continuation of the attack on quantum-mechanics (*Naturwissenschaften*, Vol. 23, 1935, pp. 807–812, 823–828, 844–849; *Camb. Phil. Soc. Proc.*, Vol. 31, 1935, p. 555) seems to me to proceed on epistemological assumptions similar to those of Einstein, and therefore I have not included him in this discussion. Margenau's remarks (*Phys. Rev.*, Vol. 49, 1936, p. 240) I have considered irrelevant to the present discussion.

[30] *Loc. cit.*, p. 397.

[31] E. C. Kemble, *Journal of the Franklin Institute*, Vol. 225 (1938), p. 263.

stein's sense, and as such it is immediately deducible from Bohr's assertions of the "formalism" of quantum theory and Heisenberg's original assumptions in constructing a matrix-mechanics in which the elements of the matrices were merely "probability amplitudes." Heisenberg [32] has contrasted in this connection the classical ideal of "objectifiability of perceptions" in terms of a visualizable mathematics with the present method of "mathematical formulation of phenomena (*Zusammenhänge*)" for the sake of clarity. This acceptance, by the younger generation of physicists, of mathematics as a useful tool, introduced merely for the sake of clarity, is an integral part of the new epistemology of quantum-mechanics, and it indicates presumably that this generation of physicists is profiting by the criticisms of the reification of concepts levelled against nineteenth-century physics by Mach, Pearson, and Bergson in the previous generation.

It is difficult to resist the belief that this wariness of physicists to hypostatize any mathematical concept has also been encouraged by the recent discoveries of the logical structure of mathematics.[33] Once mathematics has been recognized to be merely a system of tautologies, based on an arbitrary set of symbols and arbitrary rules of manipulation, it is meaningless to assert that the terms in mathematical equations which have proved successful in prediction must have a physical significance, in the sense, for instance, in which Schrödinger insists that the wave-functions must have physical significance. It is equally possible that such terms may be merely used to define a probability function which certainly has no visualizable or metaphysical significance and yet is perfectly adapted for making predictions. In short, once it is realized that the classical interpretation of the equations of physics rests in part on the assumption, which we may call the Pythagorean fallacy, that the "principles" [34] of mathematics have an ontological status, then it will likewise be recognized that the recent discoveries of the logical basis of mathematics will invalidate any attempt to ascribe physical significance in the classical sense to any mathematical concept.[35]

[32] *Mitteilungen des Universitaetsbundes Goettingen*, Jahrgang 16 (1934), Heft 1, p. 13.

[33] It is interesting in this connection to speculate on Hilbert's influence on matrix-mechanics, which was born at Göttingen.

[34] In Aristotle's sense: *Metaphysics*, A, 985b.

[35] It is interesting to note that Einstein's criterion of reality, if one remembers his obvious intention to distinguish between "elements of physical reality" and observable quantities, is simply a modern reaffirmation of the Pythagorean assumption that mathematical symbols refer to existing realities, whether one assumes with Bohr that "prediction with certainty" is to involve

This interpretation of mathematics, which applies not merely to the crucial instances of configuration-space, Riemannian geometry, and quantum-mechanics, but also to Euclidean geometry and Newtonian mechanics, seems to present, therefore, an independent basis for prediction regarding the eventual success of the prevailing interpretation of quantum-mechanics. We may conclude that, not only are there no positive metaphysical implications of modern quantum-mechanics according to the Bohr-Heisenberg interpretation, but there is a high probability that this interpretation will permanently displace the rationalistic interpretation, characteristic of classical physics, much as the rigorous treatment of the fundamental concepts of the calculus by Weierstrass and Cauchy has displaced the older notion of infinitesimals. With this general result in mind, it is clear that all those subordinate problems which receive so much current attention, such as the implications of quantum-mechanics concerning the existence of an objective indeterminism in nature, or the "real" nature of matter and radiation (whether wavy or corpuscular), or the sort of geometry which "obtains" in nature, can be easily and conclusively solved.

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THE MEETING OF EXTREMES IN RECENT ESTHETICS [1]

THE cause of philosophy has always prospered most when its concern has been with the relatively far away. The near-at-hand is the source of greatest embarrassment. Philosophy of nature thrives while philosophy of mind languishes. The detachment necessary to a genuine philosophical objectivity is much harder to achieve—if it can be achieved at all—where the subject is also the object of investigation and discourse. This is not surprising and accounts for some of the more interesting chapters in the history of philosophy. When man sets a mirror to himself he finds that only a mirror is reflected, and if he can not halt the regressus at the very start he finds himself on the highroad to solipsism. We

empirical verification or that it indicates merely the satisfaction of certain formal mathematical conditions (subsequent to normalization). It must also be noted that Einstein's argument against quantum-mechanics is invalid because he renounces his criterion of reality in appealing to Heisenberg's proscription of the simultaneous "reality" of two canonically conjugate quantities, since Heisenberg intends to assert merely the impossibility of simultaneous measurement.

[1] A slightly modified copy of a paper read before the Eastern Division of the American Philosophical Association, at Princeton University, December, 1937.

shall not be astonished then if, having looked in the mirror of his own experience, reflective man has sought to achieve self-objectivity by the *tour de force* of identifying himself with objective nature, either after the fashion of the thorough-going idealists or in the manner of their naturalistic brethren without the law. Whether a deeper "meeting of extremes" takes place, as described by that eloquent champion of idealism, Bernard Bosanquet, I shall leave for others to decide. His desire to find a fundamental basis of unity in competing theories finds a faint echo in both the title and the general lines of the argument of this paper.

But if the return to the problems of the self brings confusion, a more deep-rooted confusion is the apparent consequence of a renewed interest in problems of value. For here, and focussing our attention now on the field of esthetics, the object under investigation is not clearly discernible either as a "part of" the subject or quite objective in the sense of existent in its own right. Should the theorist look within, or to a part of the world outside himself? There is no more important or troublesome question in all axiology. And, strictly, he can not answer it until he has already made the acquaintance of the esthetic "object." When he has made that acquaintance, however, the object has become his, and unless he takes great care he is caught in the squirrel cage of phenomenalism, where the mind can not escape the treadmill of its own categories.

Confusion and conflict in esthetic theory jar the esthetic sensibilities of the tender-minded. Tough-mindedness has its moral appeal but fails by the esthetic test. It is not that one desires to reside permanently in the Chautauqua of perfect harmony and agreement. It is only that one fails to find virtue in strife—even in theory—as a consummatory object, and prefers rather to give reign to the impulse to discover and emphasize such points of agreement as can be found.

A hint that the points of agreement may both out-number and out-weigh in importance those of difference is found in a noticeable feature of much recent writing. A premium is placed on pushing to the hilt the unique aspects of the theory proposed; it and it alone can save. But how many times have we not read on, only to learn that these distinctive features are characteristic of the views that all important thinkers have always *really* believed and maintained?[2] In fact it is no longer surprising to find this claim offered to establish the very distinctiveness of the theory. That we have learned to expect this paradox is not the only reason

[2] So Croce: Article "Aesthetics," *Encyclopaedia Brittanica*, 14 ed., V. I, p. 265, "The concept of art expounded above . . . even the common people."

it has ceased to surprise. For when the theorist has said enough about the *differentia* of his own views he can safely turn to the basal fact, on which it is not surprising to find fairly general agreement, that esthetics deals with a problem of value that arises when a "subject" comes into a relationship with a special sort of "object." That subject has an experience labelled esthetic; the object is said to be an esthetic object. The judgment, that it is an esthetic object, is an esthetic judgment. Since he has not moved out of the tight circle bounded by the obscurity of the term "esthetic," this statement of course only sets the problem rather than suggests a solution. But it is important to stress this feature of the situation at the risk of seeming to simplify matters excessively. Esthetics, no more than any other division of philosophy, can not escape the requirement of standing as the interpretation of what someone finds to be a feature of his world. No one supposes any longer that the philosopher should dictate to the artist. (I should perhaps except those for whom esthetics is but a sub-form of ethics or politics.) Is it so clearly evident that esthetics is the interpretation of an experience rather than a prescription for an experience? The upshot of many treatises on the esthetic experience, attitude, or judgment is that the reader is made aware that this is not *what* he experienced, but that it is suggested as what he *should have* experienced. So far from having significance as an objection to the theory discussed this failure to interpret what the subject has apparently experienced provokes only the retort that the subject is obviously not a "fit subject." His taste is not "educated." This is what he would have experienced had he been properly instructed. To this *ad hominem*—which, unfortunately for clarity of discussion, is usually at least half true—there is no genuinely adequate reply. That it begs the question of authority and that it involves the author in a vicious circle is clear. Preoccupation with speculative or experimental analysis tends to blur the common starting point in its essential simplicity: an experience of value.

That the analysis of the experience falls heir to the manifold difficulties discoverable in the general field of epistemology follows from the assertion that it can not avoid saying something about the world. To these difficulties is added the further complication that that part of the world explored is not simple matter of fact or object of awareness (however stated or defined) but matter of fact plus value or value as matter of fact. This situation prevents esthetics from reduction to epistemology unless the latter is scaled up to the former by making all content of knowledge partake of value. Esthetics is thus caught between the cross-fire of epistemol-

ogy, since the esthetic experience is an experience, and criticism, since it is an experience of a value. The unstable equilibrium exhibited by many theories—in all the long history of the subject—is largely chargeable to this feature of the situation. The resulting dilemma is readily stated. In an analysis of the esthetic experience, one can not do without the subject of the experience, an interest in whom seems to commit one to the vagaries and futilities of epistemology (esthetics being quickly lost to view) one can not quite do without the object of experience, because there remains the persistent and reasonable suspicion that without it there would be no experience. Yet an interest in the object alone breeds its own difficulties. It will suffice at this point to indicate but one, namely, that under scrutiny that object—the content of the esthetic experience—tends to turn into the indiscriminate everything, "the whole panorama presented to us through our senses, the surface of our experienced world . . . simply the external world, including our own bodies inside and out,"[3] as one contemporary theorist remarks. "We seem to have spread the aesthetic over all heaven and earth and their total content," the same writer adds on the same page. Having thus widened the range of the esthetic field it becomes necessary for him to draw the line between the esthetic and the so-called anesthetic "in some other dimension,"[4] "as simply the top level of all that is consciously experienced, the qualitative surface of all that we are acquainted with."[5] Further discussion of how this top level is to be distinguished would be out of place here; we shall return to that problem in a later section. It is fair to let this much stand as indicating the type of problem that must be faced by a theory committed to the initial proposition that, "The esthetic is what we experience directly and of necessity when we are not totally anaesthetized." All objects that can be experienced while we have the capacity to experience esthetic objects *are* esthetic objects. I simply add that there *seem* to be other *kinds* of objects in the whole world as directly felt—objects that plainly lack esthetic value, or more accurately, to which the categories of esthetics do not apply.

The issues in esthetics are not clarified or resolved by enlarging its domain beyond the bounds of that field ordinarily indicated by common usage of terms. For we are not here dealing with a field of philosophy remote from human experience; values as concretely presented to and appreciated by selves make up the subject-matter of our investigation. We can not ignore altogether, then, what

[3] D. W. Prall, *Aesthetic Analysis*, p. 5.
[4] *Ibid.*, p. 5.
[5] *Ibid.*, pp. 9 ff.

man, the valuer, has discriminated as the esthetically valuable elements of his experience. This conclusion is altogether independent of the problem of the fit subject, introduced above. It means only that when we find the fit subject we shall pay attention to what he has to say about the delimitation of the esthetic field within the whole world of qualitative presentation.

Esthetic theories thus tend to fall into two groups loosely distinguished as subjective and objective. They differ in degree of emphasis given to the subject of the experience and to the objective status or significance of the value experienced. Some theories indeed seem to leave no place at all for the object: experience is all. Ends or values are not consummatory but instrumental. Aristotle's God thinking about thinking finds a mundane companion in man, not valuing values as real parts of the world, but valuing valuing. The beholder "must create his own experience"[6] in the presence of that which the artist has created. The reaction against the venerable substance-attribute concept of reality, with its corollary that the esthetic object is a certain kind of thing literally possessing the attached qualities ear-marking it as esthetic, seems to have been worked out to its logical conclusion in many quarters. Where the metaphysicians failed, the psychologists and epistemologists hoped for a success to be achieved by an analysis of the human reaction to or attitude towards—what? For the extreme of the position can not be stated without making evident that it amounts to a *reductio ad absurdum.* The human reaction is to a human reaction. The attitude is directed towards an attitude.

So Lipps: "Esthetic pleasure has no object at all. The esthetic enjoyment is not enjoyment of an object, but enjoyment of a self. It is an immediate feeling of a value that is lodged in oneself."[7] (Do I detect a double about-face in the meaning of the word "of"?) Where man is the measure, strife is king—and subject to no constitution. For he is measuring only his own feelings or reactions within the privacy of himself. His judgment can have no public significance and the proposal to "educate taste" is an impertinence.

But it is really not an impertinence because it is indicative of a deep-rooted inconsistency or unwillingness to go the whole way with subjectivism. When esthetic taste is referred to, critical esthetic judgment is meant: that is, taste grounded in appreciation of something. The contention that the esthetic judgment is really a "pure matter of taste"[8] derives from a pre-critical—even pre-Socratic—psychology and epistemology. I feel something or some-

[6] Dewey, *Art as Experience,* p. 54.

[7] Rader, *A Modern Book of Esthetics,* p. 293.

[8] Ducasse, *Philosophy of Art,* p. 8.

how and I like that feeling, or I don't. The value of that which I like is in my liking it. Because, finally, I like the feeling, since that is the way I feel. That must be the end of the matter, since no feeling, in itself, can be illusory or other than just what it is to the one who has it. But if subjectivism in value theory derives from a pre-critical epistemology it falls short of consistency because of the insistent counter claims of other interests. Man does not live by bread alone—no matter how pleasing to his taste—and remain a man. Nor can he live to himself alone—not even in the matter of his tastes. He has felt the impact of the idea of progress, and the requirements of sane and social life. Like Alcibiades, he has been "bitten by a more than viper's tooth." The idea of evolution has inspired him to rewrite the ancient Platonic hierarchy of values on a temporal scale. The harmony of a metaphysical system has become the symphony of an historic process. The *via mystica* has come to mean the evolution of values; the vertical line is seen as a diagonal, segmented by the scales of worth. Forsaking figures, man knows now that the refinement of taste—in some genuine sense of that over-worked phrase—is not only intelligible and possible but an esthetic, even moral, necessity.

It is safe to say at the beginning of one's treatise that "in the matters of aesthetic taste it is as with taste in cookery,"[9] if near the end we qualify it by adding, "All criticism involves reference to some character, the possession of which by the object criticized is regarded by the critic as being in some way good, of the lack of it, bad."[10] Here we have the substance-attribute metaphysic back in all its nakedness. To say that because the critic may be mistaken and takes the appearance for the reality, and that, as to pleasure these are identical, can hardly pass muster as adequate proof of the private infallibility of the critic. If, further, this suppositious infallibility, grounded ultimately in final ignorance of what the other critic is actually feeling, is offered as confirming the proposition that "Whether a given taste is possessed by one person only or by a thousand alike [sic] the maxim that '*de gustibus non est disputandum*' holds with regard to it,"[11] there is nothing left but to conclude that the *de gustibus* maxim is strictly meaningless. Moreover it may be to my taste to deny the validity of the maxim, for our question is ultimately one concerning esthetic truth. This dialectical trick is a venerable one, equally effective against any variety of subjectivism, and is no more surprising or disturbing than to be told that there is such a thing as the "refining and edu-

[9] *Ibid.*, p. 8.
[10] *Ibid.*, p. 267.
[11] *Ibid.*, p. 303.

cating of taste" as well as the "perversion and depravation of taste" but that the determination of which is which is a matter of taste.[12] The former points to a logical contradiction, the latter to an axiological absurdity.

Enough has been said to reveal subjectivism as being driven towards a meeting of extremes with objectivism. Good taste and sound esthetic judgment mean the same thing. Concerning it there is much disputing precisely because of the inevitable objective reference. Subjectivists recognize this when they pass from a definition of the esthetic experience into the field of criticism. No serious thinker has taken the maxim of *de gustibus non est disputandum* seriously and consistently, mainly because no one has seriously and consistently taken the esthetic experience to be simply an affair of indiscriminate feeling or taste. To do so would entail resting completely satisfied in the immediacy of private experience. Thorough-going subjectivism in epistemology is the equivalent of complete scepticism, which must be silent. Solipsism in metaphysics is a contradiction in terms. Axiological solipsism is in no better case. Where all are infallible none can speak. There can be no science or philosophy of the esthetic experience without reference to the esthetic object. Taste is always of something in an intelligible world.

There is no need to develop at length the argument from the other side. Thorough-going objectivism is involved in an analogous predicament. If esthetic value is not simply a feeling, it is also not an actually existent metaphysical attribute in or on the object independent of the subject.

The valid element in the objective position has already been suggested. The esthetic experience, though a personal experience, is grounded in something outside itself, judged to be an esthetic object. Concerning that judgment we may properly say that it is in some sense right or true or the opposite. The experience simply is. The judgment is right or wrong. The happening of the former is a part of the biography of the subject; the truth of the latter is relevant to the metaphysical structure of the world and a contribution to its fuller description. But it is one thing to insist on the reality of the esthetic object as a condition of the objective validity of the esthetic judgment. It is another and more difficult thing to specify precisely what sort of "thinghood" or reality that object does have. We need only remind ourselves of the astonishing diversity of judgments on the matter rendered by those supposedly competent to judge—a phenomenon that tends to support

[12] *Ibid.*, p. 303.

the position of the subjectivist. For though to admit that value is not a term characterizing a feeling or state of mind seems inescapable—(and I believe that subjectivist views really attempt to include this admission)—it does not constitute a guarantee that we have ready and complete access to whatever object it is that becomes the new habitat of value. Our problem is now with the possibility of esthetic knowledge. How recognize an esthetic object? More specifically, what objects are beautiful? The origins of scepticism here are the analogues of those of scepticism generally, and breed the same varieties of dogmatism or mysticism. Objectivism in esthetics is either a variant on the theme of recent realism or the *motif* of Platonic idealism. In the light of historical relativism it must be recognized that if esthetic quality attaches to or inheres in an object which is completely independent of the self, that self has no surely guaranteed means of knowing it, or, better, knowing when it knows it. William James reminds us that no bell rings when we hit the truth. Trailing clouds of glory we may come, but at the age of esthetic sensibility and speculative interest in it, we are blinded by the light of common day. This, however, is not the fault of the esthetic object, but a difficulty for the objectivist. As in so many areas of speculative interest the "*that*" causes less trouble here than the "*what.*"

So insistent are the claims of each of the two elements in the esthetic situation that we have experienced considerable difficulty in stating the alternative views without inconsistency. I am not sure that genuinely whole-hearted subjectivism and objectivism can be found in the literature of esthetics. The two poles are not only driven to meet but tend to fall together. At the outset the point was suggested that the types of theory were distinguishable by the degree of emphasis given to the subject and the object of the experience. Perhaps we should all be objectivists, as we should all be realists if the difficulties were not so great. We are driven to hedge. But, swinging to the other extreme, while we may have to admit that there is no convincing logical disproof of subjectivism, we can not ignore the force of the contention that, as one writer has bluntly put it, "it fails to make provision for the undoubted fact that we all of us do feel that it is better that an uncontemplated [Sistine] Madonna [of Raphael] should exist than an uncontemplated cesspool. . . . We do, that is to say, believe in our hearts that beauty is better than ugliness, even if there is nobody to enjoy it."[13] That this belief begs the academic point at issue is admitted. But the claim that it is pertinent to the larger issues

[13] Joad, *Guide to Philosophy*, pp. 346 f.

of esthetics, even though not standing as proof, can not lightly be dismissed.

The straddle resulting from the efforts to do justice to the esthetic object and the experience of it is variously described without concealing the unity of mind that somehow both must be retained. Turn again to Professor Prall's *Aesthetic Analysis.*

> The world in all its actually presented concrete character . . . is more or less interesting to us, hence more or less objectionable or acceptable, liked or disliked. That is to say, the response to it is to some degree emotional. As our response is integral to the process conditioning the world's appearance in all of its aspects, so the emotionally conditioned or conditioning aspects of our response condition its emotional character. Hence its emotional character, its *feeling,* that is, the way it feels to us, is no less genuinely "objective" than its colors or its sounds, its shapes, its hardness, its presented spread and size; hence also no less objective than those units of measurement and those structural relations to which we confine our attention in the natural sciences and their symbolic formulations.[14]

Again,

> Qualitative terms are thus quite simply the names for the way things feel to us. . . . Whatever is one individual thing feels just as it does and not quite like anything else, in the same way in which the figure two is distinct from the figure three.[15]

But feeling seems to have another meaning as well.

> When all of the sensuous elements are apprehended in just those relational structures which they constitute by virtue of the relations established in their native order, this grasp would not be the concrete apprehending of an aesthetic object, were it not the fact that such apprehension is in its very nature feeling. The feeling is strictly aesthetic, however, only if it is directed exclusively *upon* the object, so that it is properly the feeling of that object, not an irrelevance suggested by some incidental aspect of it.[16]

Mr. Prall recognized elsewhere that he appears to be confusing two very different meanings of the word "feeling." His rejoinder reveals how he effects the reconciliation of the subjective and objective interests. He says:

> But I think that we can show quite simply that this apparent difference of kind turns out, so far as aesthetics is concerned, to be one of clarity, simplicity, and determinateness, not one of the inner spiritual and the outer material, not a genuine separation between our own private being and possessions and the world's publicly available presence as not ours and not ineffable. *For our bodies are integral parts of our world;* and all experienced content, no matter what the degree of abstraction and simplification . . . is ineffable in one and the same sense.[17]

[14] Prall, *Aesthetic Analysis,* p. 143.
[15] *Ibid.,* pp. 148 f.
[16] *Ibid.,* p. 19. My italics.
[17] *Ibid.,* pp. 149 f. My italics.

There is thus no ultimate duality of esthetic aspect and response. Esthetic feeling is of the object's feeling or how *it feels*. We know this, perhaps, by a kind of animal faith.

It must suffice simply to refer to one or two other devices employed to effect the meeting of extremes. To the contention by Lipps (quoted above) that esthetic pleasure has no object at all should be added his further word on the matter.

> On the other hand . . . in esthetic enjoyment this sense of value is objectified. . . . The specific characteristic of esthetic pleasure has now been defined. It consists in this: that it is the enjoyment of an object, which however, so far as it is the object of *enjoyment*, is not an object, but myself. Or, it is the enjoyment of the ego, which however, so far as it is esthetically enjoyed, is not myself but objective. . . . Empathy is the fact here established, that the object is myself and by the very same token this self of mine is the object. Empathy is the fact that the antithesis between myself and the object disappears, or rather does not yet exist.[18]

But do we thus escape the distinction, even though the difference is slurred? Mr. Santayana suggests that, "Beauty is pleasure regarded as the quality of the thing."[19] It is value objectified. Mr. Parker states the matter in similar terms. "Even the most intimate of esthetic experiences, of music and of lyric poetry, are objectified—myself they are, yet not myself."[20] Finally, Bosanquet, parting company, as he says, with Croce, insists "that though feeling is necessary to its embodiment, yet also the embodiment is necessary to feeling."[21] We should not have objectified the pleasure had we not already taken pleasure in the object.

In conclusion I suggest (merely) that the widespread acceptance of the idea that the esthetic interest must be distinguished from the intellectual, the practical, and the moral in terms that echo Kant's principle of "disinterested satisfaction" is further evidence in a different area of a movement towards a meeting of extremes. It does not matter whether the distinction is described in such terms as detachment, psychical distance, isolation, the irrelevancy of the representative element, the sense of unreality, or any of the other current expressions. The idea is fundamentally the same, and is not unrelated to the main argument of this paper. For disinterestedness is a notion or a characteristic of an attitude towards an object. It means nothing if either the subject or the object is asked to stand alone as the locus of esthetic value. It is likewise meaningless if both subject and object are merged into an

[18] Rader, *op. cit.*, pp. 293 f.

[19] Santayana, *The Sense of Beauty* (Rader, p. 139).

[20] Rader, *op. cit.*, p. 78.

[21] Bosanquet, *Three Lectures on Aesthetics* (Rader, p. 196).

indiscriminable whole, whether of the naturalistic, idealistic, or neutral variety. It does so historically; and it does so theoretically. It does so even in the esthetics of Croce, whose dialectic forbids exclusive negations. Esthetic analysis issues in an acceptance of some form of dualism. If this means bifurcation, bifurcation is what I mean.

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BOOK REVIEW

Language and Reality. The Philosophy of Language and the Principles of Symbolism. WILBUR MARSHALL URBAN. (Library of Philosophy.) New York: The Macmillan Company. 1939. 755 pp. $5.50.

Language and Reality is a book of genuine philosophical and cultural significance because the problems with which it deals are basic not only for philosophy but for science, art, and religion; because they have a special exigency at the present time; and because they have here been subjected to a stimulating analysis. The author's exposition is often repetitious, involved, and deficient in clarity and precision. The use of innumerable sections and subsections is confusing, and the table of contents and index are woefully inadequate. As a result, I have repeatedly found myself, during a very careful reading, in doubt as to the precise meaning intended. As I have interpreted it, the central argument seems to me to be coherent, sound, and very important. But I am not sure that this interpretation is one which the author would himself accept. I have therefore thought it best, in fairness to him and to the reader of this JOURNAL, to try to summarize the argument so far as possible in the author's own words.

The central thesis is that intuition and expresssion are inseparable—that all knowledge is, in the last analysis, discourse, and that "the conditions of intelligible communication become the basal problems of any philosophy" (p. 14). Hence the perennial importance of the problems of language. The special urgency of these problems today arises from the fact that "something of the nature of a crisis in our culture is present and that preoccupation with problems of language is . . . symptomatic. . . . To question language is to question culture. The Sophistic movement in Greece and the nominalistic movement in mediaeval thought were symptoms of such crises." Similarly today, "a philosophy of language such as that of the New Positivists, which would eliminate whole

areas of human discourse as meaningless and unintelligible, has significant implications for human culture. It might conceivably be the prelude to a brave new world . . . , a wholly 'scientific' era. It might, on the other hand, conceivably be a symptom of a decaying culture and a prelude to a scientific barbarism and a cultural nihilism" (pp. 12–13). Hence the polemical character of much of the argument, and its peculiar relevance to the modern scene.

The first eight chapters, comprising Part I, on "The Philosophy of Language," are devoted to a systematic analysis of the origin of language; of language as the bearer of meaning; of linguistic validity; of the conditions of intelligible communication; and of the relation of language to logic and to cognition. Part II, on "The Principles of Symbolism," develops a general theory of symbolism and then considers in detail the rôle of symbolism in poetry, science, religion, and metaphysics. Though the task is by no means an easy one, I shall try to give some indication of the author's treatment of these subjects.

Chapter I surveys the main problems to be dealt with and formulates the central thesis that language is *not* a veil between us and reality but that "reality, as we know it, is to an incalculable degree an ideal construction in which language itself is the chief organ" (p. 51). Chapter II investigates the nature and origin of language with special regard to the "positivistic and idealistic voices" in linguistic science, and concludes that "the notion of speech as a non-instinctive, voluntary, and purely human activity is increasing rather than decreasing" (pp. 92–93). The recognition that language is, in essence, "meaningful communication between man and man" (p. 95) sets the problem for "philosophical semantics." Pre-linguistic or "behavioural" meaning is carefully differentiated, in Chapter III, from genuine linguistic meaning, and the "naturalistic" interpretation of language is criticized from the "idealistic" point of view. Chapter IV is devoted to the phenomenology of linguistic meaning with special regard to the three primary functions of language, i.e., the indicative, emotive, and representative or symbolic, and to the "primordial and indispensable 'parts of speech,' " i.e., the noun, the verb, and the adjective. Words are shown to have an "intuitive" meaning and "value words" to be not meaningless, as the nominalists would contend, but meaningful and essential for the apprehension of objective values. The resultant problem of linguistic validity is discussed in Chapter V with special reference to "the mobility of language and consequent mutation of meaning; the ambiguity of words and the problem of context; the empirical criterion of meaning and the problem of a privileged context" (p. 226). It is

urged that the notion of empty or meaningless words is erroneous and that words derive their meaning ultimately from reference to a context or universe of discourse. In discussing the possibility of intelligible communication, the author contends that naturalistic accounts fail to recognize "the basal condition of all intelligible, as distinguished from behavioural, communication—namely, the mutual acknowledgement of the same universe of discourse and of its presuppositions" (p. 239). In Chapter VII logic is shown to be "not only the mould of thought but . . . the condition of all intelligible expression," yet not "the sole or the sufficient condition." "Logic can give only correctness, never truth." Hence "the problem of the truth of logic lies beyond logic. It is a metalogical or epistemological problem" (pp. 328–329). In Chapter VII the limitations of knowledge by mere acquaintance and by description are made clear, and the essential rôle of interpretation is emphasized. Truth is a function of "adequate expression" and "intelligibility." "The totality of intelligible discourse *is* the truth" (p. 392).

The author's general theory of symbolism is elaborated in the opening chapter of Part II. The "genuine symbol" is differentiated from the "mere sign" by its intuitive and metaphorical character. Every symbol is shown (*a*) to stand for something, i.e., to have a reference beyond itself, (*b*) to have a dual reference, namely, to the original object and to the object for which it now stands, (*c*) to contain both truth and fiction (a fact which forbids us to take it merely literally), and (*d*) to permit of a "dual adequacy." It follows that the symbolic meaning of a symbol or symbol sentence is never the literal meaning, and that the symbolic meaning always requires expansion. "All expansion of symbols is ultimately verbal" (p. 430), and "the determination of the truth of a symbol is always indirect" (p. 444), i.e., by translation of symbolic sentences into relatively non-symbolic or literal sentences and verification of these sentences. Naturalism, asserting "the prior rights of physical propositions and of the physical context" (p. 448), turns all symbols into illusions or fictions and thus brings about "the ultimate dissolution of symbols in all regions of symbolism, aesthetic, religious, and scientific" (p. 449). The transcendental theory, in contrast, recognizes that "the general movement of language is from the physical to the spiritual" (p. 426), and that, in all symbolism, "images or ideas are taken from narrower and more intuitable relations and used as *expressions* for more ideal and universal relations which, because of their very pervasiveness and ideality, cannot be either directedly intuited or expressed" (p. 450).

"There are different forms or types of symbols which . . . have different functions and different ways of expressing reality. In other words, there are different universes of discourse, . . . the poetic, the scientific, the religious, and . . . the metaphysical—and these universes have different symbolic forms" (pp. 453–454). These are now analyzed in turn.

Art is the esthetic embodiment or expression of non-esthetic meaning. Poetic language is evocative, but it is also intuitive. By the use of metaphor, poetic sentences "conjure up, so to speak, a living reality" (p. 463). It is by poetic distortion or deviation from literality that "certain aspects of reality are apprehended and expressed which could not be otherwise shown forth" (p. 473). Hence poetry, at its best, is truly revelatory; it is "truer than history"; and the truths it expresses are essentially normative and spiritual. It thus catches what science necessarily misses. But though "poetry says what it means—it does not say *all* that it means; in attempting to say this 'all' it often ceases to be poetry. . . . The transition to metaphysics is inevitable" (p. 500).

Scientific language is contrasted both with the pre-scientific language of common sense and with the essentially dramatic language of poetry. It makes use of mathematics but is not reducible to mathematical formulae. It has its own distinctive symbols which, like other symbols, have a dual meaning—a "limited, technical meaning," and a "more general philosophical significance." These meanings, particularly the second, also require expansion. "According to the operational theory, science, strictly speaking, says nothing about the cosmos; it merely operates" (p. 537). Actually, science *does* "tell us something" about the cosmos. But it can do so only by resorting to appropriately "dramatic" language and becoming implicitly philosophical. Thus science, "in its full untruncated form," is, like poetry, a "covert metaphysics" (p. 564).

The language of religion is in essence "numinous poetry." "It evokes feelings, but it also invokes objects. Invocation of spirits, of saints and angels, and of the Godhead itself, is of the very essence of religion, and distinguishes its language from that of poetry" (p. 573). "The religionist also catches something which both the poet and the scientist miss, and that something it renders in its unique language and in its special symbolic form" (p. 578). "The religious symbol is always supernatural in all the possible meanings of this word" (p. 582). Hence the importance of interpreting religious language and religious mythology not literally, but in terms of a religious realism. Religion is pre-eminently "covert metaphysics." "Translation from the implicit symbolic

to the explicit metaphysical is inherent in religion itself" (p. 624). This does not mean, however, that religion should be wholly "dissolved" into metaphysics; it should merely be "interpreted." "Such interpretation involves translation of the language of religion into the language of metaphysics, but a translation which retains the meaning of religion" (p. 626).

The distinctive subject-matter of metaphysics is the realm of "metempirical entities." It makes explicit the "co-implicates" of all experience. Its language is akin to that of poetry and to that of science, yet it is not identical with either. It is "a particular literary *genre*." The subject of a metaphysical sentence is always a pervasive metempirical entity; its predicate is always taken from a narrower empirical domain; metaphysical language is thus *essentially* metaphorical. "The ultimate object of metaphysical discourse is to say something significant about the whole of reality and . . . something that is true" (p. 651). Metaphysical truth can be tested only according to the criterion of intelligibility, i.e., coherence and adequacy. A metaphysical proposition "cannot be verified directly in experience [but] it is indirectly verifiable in the sense that it does or does not make our experience as a whole intelligible" (p. 673). "Intrinsic intelligibility, self-authenticating rationality, is the only meaning of truth possible in this maximum context" (p. 682). The final chapter reaffirms the thesis of *The Intelligible World* that *philosophia perennis,* "the natural metaphysic of the human mind," is a subject-attribute metaphysic expressible only in a subject-predicate language, and that this metaphysic is the only one that speaks an intelligible language.

This bald summary will, I hope, sufficiently indicate the scope and tenor of the book to convince the reader that he should study the argument in all its ramifications for himself. Nominalists and naturalists, whose position is so effectively attacked on so many different fronts, are under peculiar obligation to meet this attack or else acknowledge their inability to do so. In the fields of linguistics, logic, science, religion, and art, the author may well be challenged on various specific points. These sections deserve a detailed critique. I should, myself, query the priority given to verbal expression in the arts and the claim that only in metaphysics can the real meaning of poetic and other symbolic utterance be expressed with maximum adequacy. And I am not yet persuaded that communication is *in principle* as essential to the apprehension of truth as the author insists. These and other criticisms suggest themselves and invite elaboration. None the less, the book provides a powerful and much-needed critique of dominant

contemporary tendencies not only in philosophy but in other realms of discourse. No serious philosopher, whatever his philosophical persuasion, can afford to neglect it, and specialists in various fields should study it with diligence.

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BOOK NOTES

Nietzsches "System" in seinen Grundbegriffen. Eine prinzipielle Untersuchung. ERICH HEINTEL. Leipzig: Felix Meiner. 1939. viii + 220 pp. 8 M.

This work essays the complicated task of examining the many-sided fundamentals of Nietzsche's philosophy and his place in the history of thought from the standpoint of the epistemological, emergent idealism of Robert Reininger, whom Dr. Heintel calls master. This plan necessitated, in the author's eyes, a rapid survey of philosophical trends from ancient to modern times. The brevity and comprehensiveness of this "historical-systematic foundation" for the interpretation of Nietzsche, serves to obscure instead of illuminate the principles to be examined. But when these academic preliminaries are finally over, the reader is confronted with a sympathetic, lucid, and balanced critique of the several phases of Nietzsche's thought and career. For Nietzsche, the ego and its experience are alone actual, while the extended world is posited by the ego, not either as a "fiction" or as an absolute reality, but in "biological" terms, thus reifying an organic hierarchy of Nature. But in Nietzsche this theoretical, "naturalistic" strand is interwoven with an idealistic interpretation of values. Valuing, Dr. Heintel shows, is for Nietzsche a process of creative self-transcendence which enlists the energies of the whole personality. The criterion of truth and reality on the "practical" side is thus the intensification of the will to power. Morality is a discipline for growth. Apollinian rationalism and Dionysian dynamism are locked in ceaseless struggle, even as were Nietzsche's own mind and heart. He could be neither naturalist nor mystic, nor could he be content with a compromise. The task of philosophy, Dr. Heintel thinks, is to accept Nietzsche's challenge and seek ever anew to understand and develop both the theoretical and practical aspirations of the living ego.

O. F. K.

OTHER NEW BOOKS AND JOURNALS

Boucher, Chauncey Samuel: The Chicago College Plan. Revised and Enlarged, after Ten Years' Operation of the Plan, by A. J. Brumbaugh. Chicago: University of Chicago Press. 1940. xiii + 413 pp. $3.00.

THE PERSONALIST. Spring, 1940. The Need and the Illusion of Absolutes: *R. T. Flewelling.* Philosophical Personality: *G. E. Mueller.* Deism and Samuel Taylor Coleridge: *Nancy Moore.* Edmund Husserl—An Appreciation: *E. P. Welch.* Imitation, Selfhood and Personality: *P. R. Helsel.* A Note on the Appeal of Music: *M. W. Hess.* Significance of Whitehead's Philosophy for Psychology: *P. L. Weber.*

BULLETIN DE LA SOCIÉTÉ FRANÇAISE DE PHILOSOPHIE. 39e Année, No. 1. Le "psychologique" et le "vital": *Raymond Ruyer.*

RIVISTA DI FILOSOFIA. Volume I, N. 1. La dottrina kantiana del matrimonio: *G. Solari.* Un retore semi-sofista: Trasimaco di Calcedone: *Platonicus.*

NOTES AND NEWS

We regret to learn of the death of Professor John Henry Muirhead at his home in Rotherfield, Sussex, England, on May 24, 1940, at the age of 85.

The Nicholas Murray Butler Medal is awarded quinquennially in gold by Columbia University for the most distinguished contribution made during the preceding five-year period anywhere in the world to philosophy or to educational theory, practice, or administration. This year, it has been awarded to Henri Bergson in recognition of his *Two Sources of Morality and Religion,* the latest fruits of a long and distinguished career. In 1915 the award was made to Bertrand Russell, in 1920 to Benedetto Croce, in 1925 to Edward Lee Thorndike, in 1930 to Alfred North Whitehead, and in 1935 to John Dewey.

Dagobert D. Runes, editor of *Philosophic Abstracts,* is planning to publish a *Dictionary of Philosophy* in the spring of 1941. Information may be obtained by addressing the editor of the volume at 884 Riverside Drive, New York City.